Claims

[c1] What is claimed is:

1.A method for maintaining connectivity between a mobile unit and a base station in a wireless communications system, the mobile unit comprising a Radio Resource Control (RRC) used to establish at least a radio bearer when the mobile unit is within a service area of the base station and capable of releasing the radio bearer, the RRC comprising a plurality of internal states, each state defining a connective relationship between the RRC and the base station, the method comprising:

starting a second timer as the result of the expiration of a first timer when the RRC is in a CELL_PCH state or a URA_PCH state and when the RRC detects an out of service condition of an established radio bearer;

detecting an in service condition of the radio bearer before expiration of the second timer; and

stopping the second timer to prevent expiry of the second timer so as to prevent releasing of the radio bearer.

[c2] 2.The method of claim 1, wherein the CELL_PCH state and the URA_PCH state both have no dedicated physical channel between the mobile unit and the base station, and no uplink activity is possible for the mobile unit.

[c3] 3.The method of claim 1, wherein the first timer is used to indicate timing of a periodical Cell Update procedure.

[c4] 4.The method of claim 1, wherein the second timer is used to limit a duration used by the RRC to detect an in service condition of the radio bearer before the RRC releases the radio bearer and enters an Idle Mode.

[c5] 5.The method of claim 1, further comprising:

starting the second timer as the result of the expiration of the first timer when the RRC is in a CELL_FACH state and when the RRC detects an out of service condition of an established radio bearer;

detecting the in service condition of the radio bearer before expiration of the second timer; and

stopping the second timer if a Cell Update procedure is not ongoing and a URA

Update procedure is not ongoing.

[c6] 6.The method of claim 1, further comprising:
starting a third timer used for limiting a duration used by the RRC to detect an in service condition of the radio bearer before the RRC releases allocated resources and enters an Idle Mode; and
stopping the third timer when the in service condition of the radio bearer is detected before expiration of the third timer if a Cell Update procedure or a URA Update procedure is ongoing.

[c7] 7. A method for maintaining connectivity between a mobile unit and a base station in a wireless communications system, the mobile unit comprising a Radio Resource Control (RRC) used to establish at least a radio bearer and capable of releasing the radio bearer, the RRC comprising a plurality of internal states, each state defining a connective relationship between the RRC and the base station, the method comprising steps in the following order:
the RRC entering a CELL_FACH state in which the mobile unit is known to the base station on a cell level, no dedicated channel is allocated to the mobile unit, and the mobile unit is assigned a default common or shared transport channel for uplink and downlink;
the RRC detecting an out of service condition of an established radio bearer while in the CELL_FACH state;
starting a second timer as the result of the expiration of a first timer, the first timer being used to indicate timing of a periodical Cell Update procedure, the second timer being used to limit the duration to detect an in service condition of the radio bearer before the RRC releases the radio bearer and enters an Idle Mode;
detecting the in service condition of the radio bearer before expiration of the second timer; and
stopping the second timer if a Cell Update procedure is not ongoing and a URA Update procedure is not ongoing.

[c8] 8. A method for maintaining connectivity between a mobile unit and a base station in a wireless communications system, the mobile unit comprising a

Radio Resource Control (RRC) used to establish at least a radio bearer when the mobile unit is within a service area of the base station and capable of releasing the radio bearer, the RRC comprising a plurality of internal states, each state defining a connective relationship between the RRC and the base station, the method comprising steps in the following order:

entering a CELL_FACH state in which the mobile unit is known to the base station on a cell level, no dedicated channel is allocated to the mobile unit, and the mobile unit is assigned a default common or shared transport channel for uplink;

the RRC detecting an out of service condition of an established radio bearer while in the CELL_FACH state;

starting a third timer used for limiting a duration used by the RRC to detect an in service condition of the radio bearer before the RRC releases allocated resources and enters an Idle Mode;

detecting the in service condition of the radio bearer before expiration of the third timer; and

stopping the third timer if a Cell Update procedure is ongoing, or stopping the third timer if a URA Update procedure is ongoing.